

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

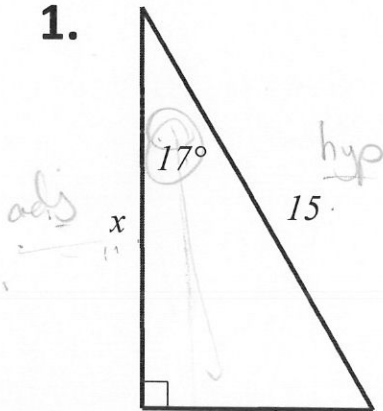
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

## STATION #1

# Trigonometric Ratios

**DIRECTIONS:** Solve for x. Round your answers to the nearest hundredth.

1.

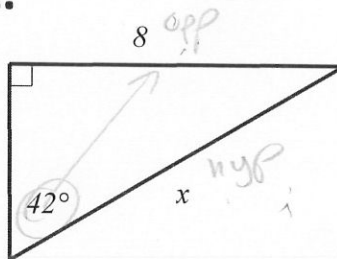


$$\cos 17 = \frac{x}{15}$$

$$x = 15 \cdot \cos 17$$

$$x \approx 14.34$$

2.



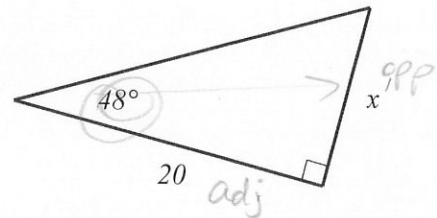
$$\sin 42 = \frac{8}{x}$$

$$8 = x \sin 42$$

$$\frac{8}{\sin 42} = x$$

$$11.96 \approx x$$

3.

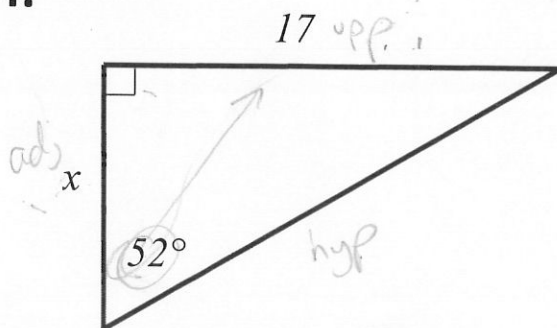


$$\tan 48 = \frac{x}{20}$$

$$x = 20 \cdot \tan 48$$

$$x \approx 22.21$$

4.



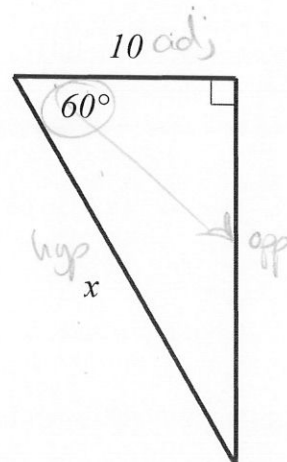
$$\tan 52 = \frac{17}{x}$$

$$17 = x \tan 52$$

$$\frac{17}{\tan 52} = x$$

$$13.28 \approx x$$

5.



$$\cos 60 = \frac{10}{x}$$

$$\frac{10}{\cos 60} = x$$

$$\frac{10}{\cos 60} = x$$

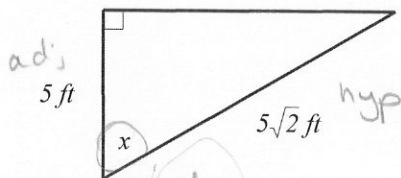
$$20 = x$$

## STATION #2

# Inverse Trigonometric Ratios

**DIRECTIONS:** Solve for  $x$ . Round your answers to the nearest hundredth.

6.

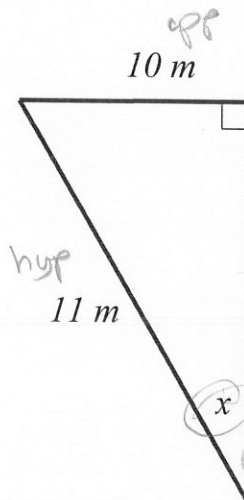


$$\cos x = \frac{\text{adj}}{\text{hyp}} = \frac{5}{5\sqrt{2}}$$

$$x = \cos^{-1}\left(\frac{5}{5\sqrt{2}}\right)$$

$$x = 45^\circ$$

7.

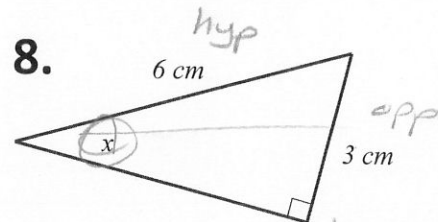


$$\sin x = \frac{\text{opp}}{\text{hyp}} = \frac{10}{11}$$

$$x = \sin^{-1}\left(\frac{10}{11}\right)$$

$$x \approx 65^\circ$$

8.

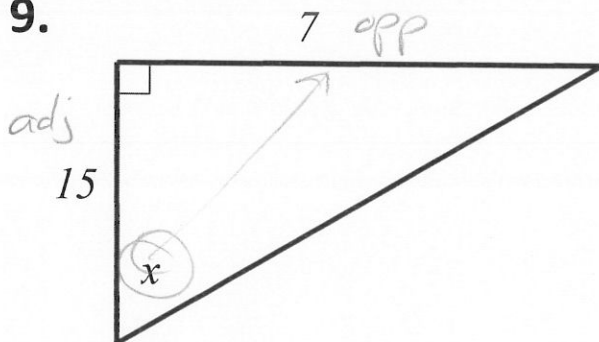


$$\sin x = \frac{\text{opp}}{\text{hyp}} = \frac{3}{6}$$

$$x = \sin^{-1}\left(\frac{3}{6}\right)$$

$$x = 30^\circ$$

9.

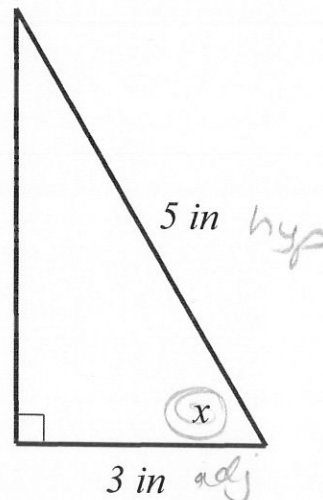


$$\tan x = \frac{\text{opp}}{\text{adj}} = \frac{7}{15}$$

$$x = \tan^{-1}\left(\frac{7}{15}\right)$$

$$x \approx 25^\circ$$

10.



$$\cos x = \frac{\text{adj}}{\text{hyp}} = \frac{3}{5}$$

$$x = \cos^{-1}\left(\frac{3}{5}\right)$$

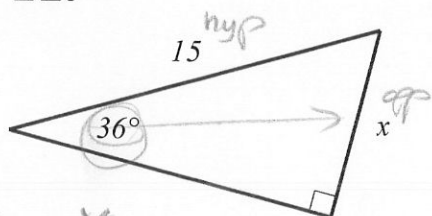
$$x \approx 53^\circ$$

## STATION #3

# Solving for Sides or Angles

**DIRECTIONS:** Determine which trigonometric ratio or inverse you need to use to solve for  $x$ . Then, solve for  $x$ . Round your answers to the nearest hundredth.

11.

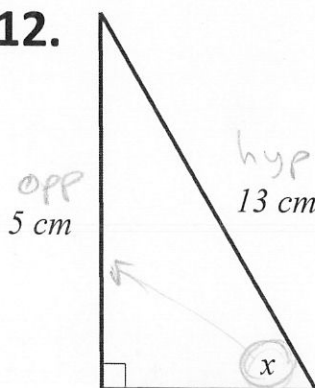


$$\sin 36 = \frac{x}{15}$$

$$x = 15 \sin 36$$

$$x \approx 8.82$$

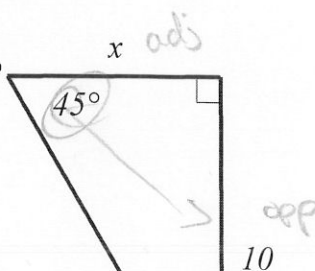
12.



$$\sin x = \frac{5}{13}$$

$$x \approx 23^\circ$$

13.

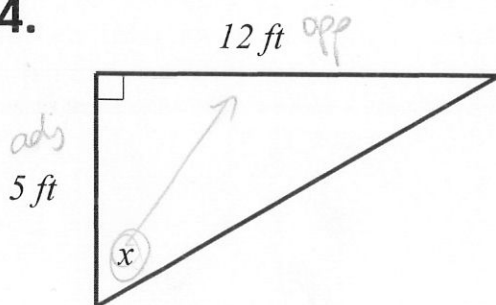


$$\tan 45 = \frac{10}{x}$$

$$10 = x \cdot \tan 45$$

$$10 \approx x$$

14.

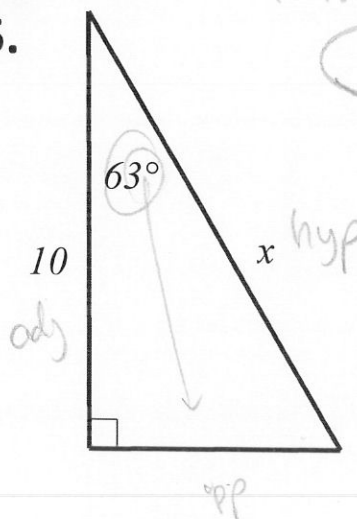


$$\tan x = \frac{12}{5}$$

$$x = \tan^{-1} \left( \frac{12}{5} \right)$$

$$x \approx 67^\circ$$

15.



$$\cos 63 = \frac{10}{x}$$

$$10 = x \cos 63$$

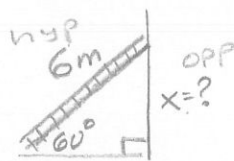
$$x \approx 22.03$$

## STATION #4

# Applications of Trigonometry

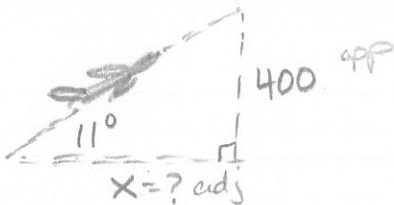
**DIRECTIONS:** Draw a picture to represent each situation. Then, solve for the indicated measurement. Round your answers to the nearest hundredth.

16. A 6 meter long ladder leans against a building. If the ladder makes a  $60^\circ$  angle with the ground, how far up the wall does the ladder reach?



$$\begin{aligned}\sin 60 &= \frac{x}{6} \\ \downarrow & \quad \downarrow \\ x &= 6 \cdot \sin 60 \\ x &\approx 5.20\text{m}\end{aligned}$$

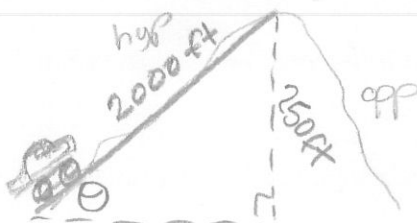
17. An airplane climbs at an angle of  $11^\circ$  with the ground. Find the horizontal distance it has traveled when it has reached an altitude (height) of 400 feet.



$$\begin{aligned}\tan 11^\circ &= \frac{400}{x} \\ \downarrow & \quad \downarrow \\ 400 &= x \cdot \frac{\tan 11^\circ}{\tan 11^\circ}\end{aligned}$$

$$x \approx 2057.82$$

18. In order to reach the top of a hill which is 250 feet high, one must travel 2000 feet up a road that leads to the top. How many degrees is that angle that the road makes with the horizontal?



$$\sin^{-1} \sin \theta = \frac{250}{2000}$$

$$\theta = \sin^{-1} \left( \frac{250}{2000} \right)$$

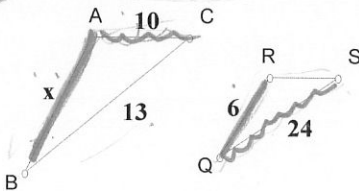
$$\theta \approx 7^\circ$$

## STATION #6

# Sides/Angles in Similar Figures

**DIRECTIONS:** Find  $x$  in the similar figures below. SHOW WORK.

24.  $\triangle ABC \sim \triangle QRS$

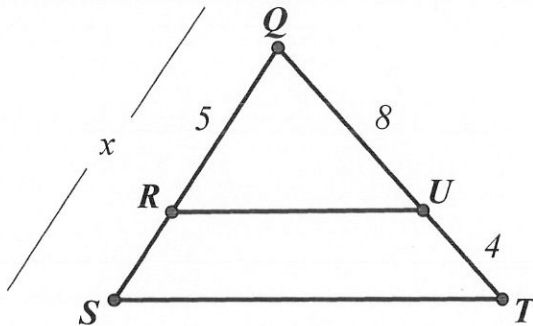


$$\frac{x}{6} = \frac{10}{24}$$

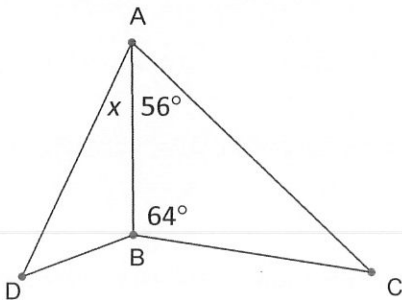
$$60 = 24x$$

$$2.5 = x$$

25.  $\triangle QRU \sim \triangle QST$



26.  $\triangle ABC \sim \triangle DBA$

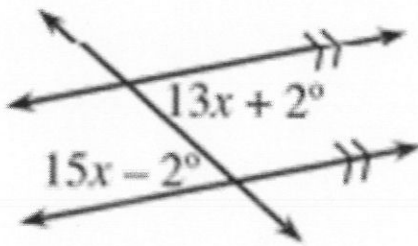


## STATION #9

# Angle Measurements

**DIRECTIONS:** Use your knowledge of angles to solve for  $x$ . SHOW WORK.

32.

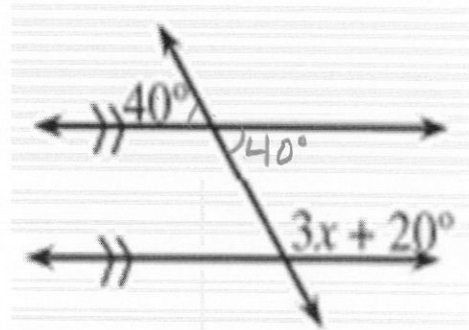


$$15x - 2 = 13x + 2$$

$$2x = 4$$

$$x = 2$$

33.



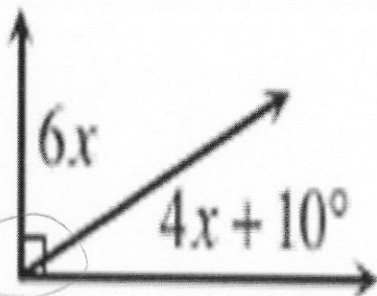
$$40 + 3x + 20 = 180$$

$$3x + 60 = 180$$

$$3x = 120$$

$$x = 40$$

34.



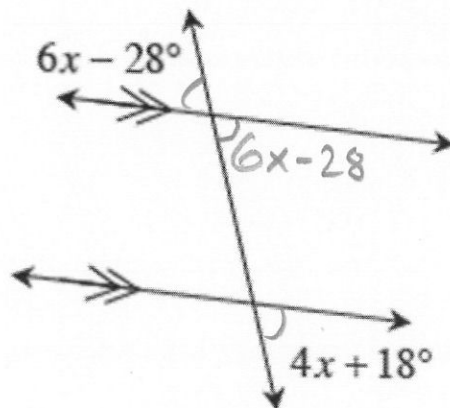
$$90 = 6x + 4x + 10$$

$$90 = 10x + 10$$

$$80 = 10x$$

$$8 = x$$

35.



$$6x - 28 = 4x + 18$$

$$2x = 46$$

$$x = 23$$

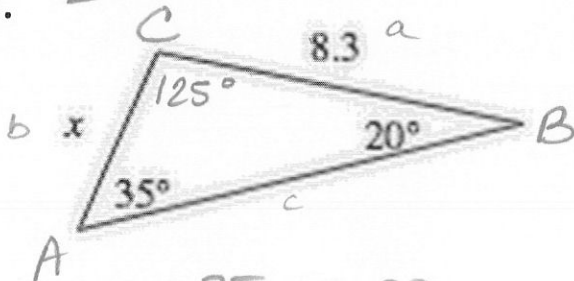


## STATION #10

# Law of Sines & Law of Cosines

**DIRECTIONS:** Solve for x. Round your answers to the nearest hundredth.

36. Law of Sines  $\frac{\sin A}{a} = \frac{\sin B}{b}$

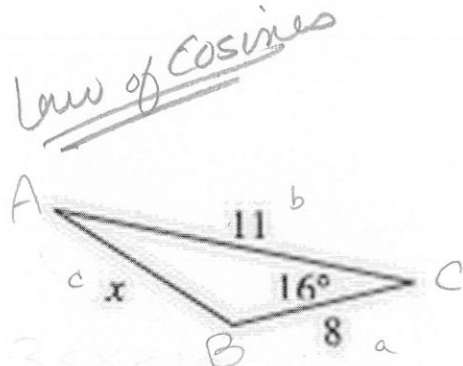


$$\frac{\sin 35}{8.3} = \frac{\sin 20}{x}$$

$$\frac{8.3 \sin 20}{\sin 35} = \frac{x \sin 35}{\sin 35}$$

$$4.95 \approx x$$

37.



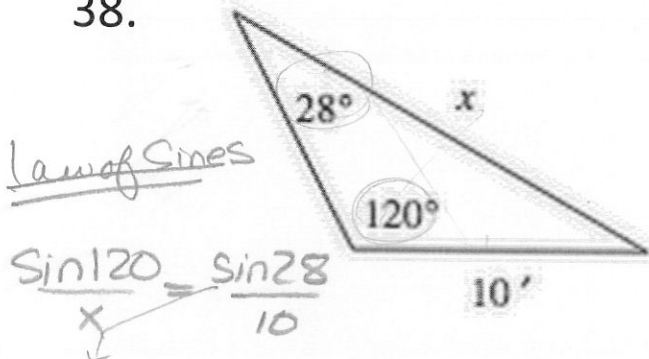
$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$c^2 = 8^2 + 11^2 - 2 \cdot 8 \cdot 11 \cdot \cos 16^\circ$$

$$c^2 \approx 15.8179$$

$$c \approx 3.98$$

38.

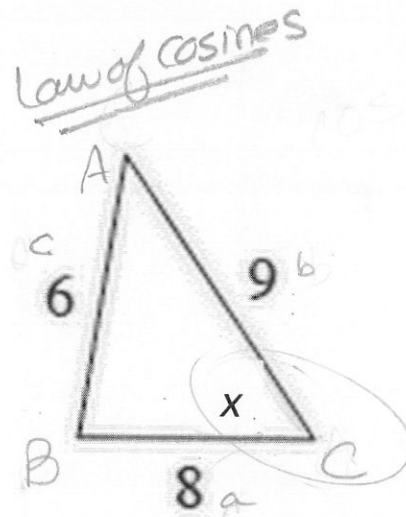


$$\frac{\sin 120}{x} = \frac{\sin 28}{10}$$

$$\frac{x \sin 28}{\sin 28} = \frac{10 \cdot \sin 120}{\sin 28}$$

$$x \approx 18.45$$

39.



$$\cos C = \frac{c^2 - a^2 - b^2}{-2ab}$$

$$\cos X = \frac{6^2 - 8^2 - 9^2}{-2 \cdot 8 \cdot 9}$$

$$X = \cos^{-1} \left( \frac{6^2 - 8^2 - 9^2}{(-2 \cdot 8 \cdot 9)} \right)$$

$$X \approx 41^\circ$$